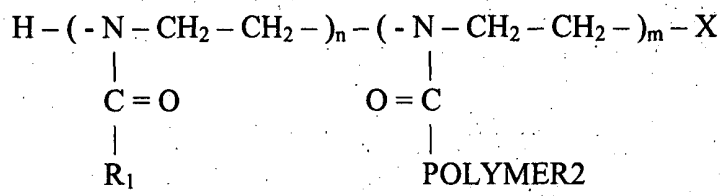
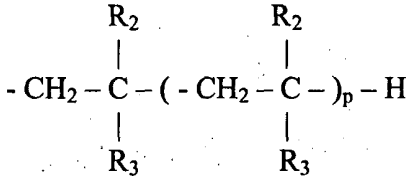
We claim:

1. A polymeric material having the structure



wherein R_1 is selected from the group consisting of hydrogen, methyl, ethyl, and propyl, X is selected from the group consisting of acetate, p-tosylate, halide, sulfate, triflate, and mixtures thereof, and POLYMER2 is a water-insoluble polymeric material having a number average molecular weight in excess of 5,000.

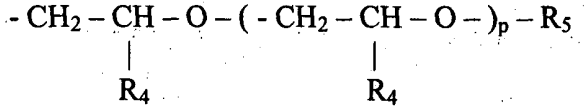
2. The composition of claim 1, wherein POLYMER2 has the structure



wherein R_2 is selected from the group consisting of hydrogen, methyl, and mixtures thereof, and R_3 is selected from the group consisting of hydrogen, methyl, ethenyl, isopropenyl, carbomethoxy, phenyl, and mixtures thereof.

3. The composition of claim 2, wherein n is between about 50 to about 10,000, m is adjusted such that m/(n + m) is between about 0.0001 to about 0.20, and p is between about 60 to about 1250.

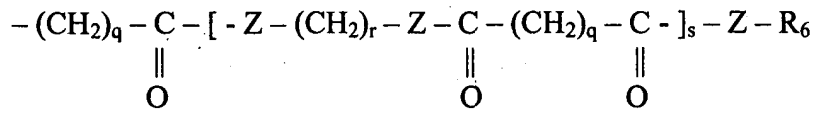
4. The composition of claim 1, wherein POLYMER2 has the structure



wherein R_4 is selected from the group consisting of hydrogen, methyl, and mixtures thereof, and R_5 is hydrogen or alkyl.

5. The composition of claim 4, wherein n is between about 50 to about 10,000, m is adjusted such that m/(n + m) is between about 0.0001 to about 0.20, p is between about 60 to about 1250.

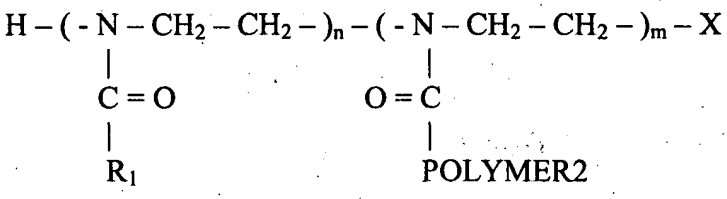
6. The composition of claim 1, wherein POLYMER 2 has the structure



wherein Z is selected from the group consisting of O, NH, and mixtures thereof, and R_6 is selected from the group consisting of methyl, ethyl, propyl, and butyl.

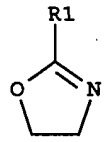
7. The composition of claim 6, wherein n is between about 50 to about 10,000, m is adjusted such that m/(n + m) is between about 0.0001 to about 0.20, q is between 4 to about 12, r is between 4 to about 12, s is between about 25 to about 450

8. A method to form a polymeric composition having the structure



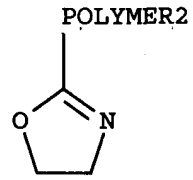
wherein R_1 is selected from the group consisting of hydrogen, methyl, ethyl, and propyl, X is selected from the group consisting of acetate, p-tosylate, halide, sulfate, triflate, and mixtures thereof, and POLYMER2 is a non-water soluble polymeric material having a number average molecular weight of 5,000 or greater; comprising the steps of:

supplying a first monomer having the structure



wherein R1 is selected from the group consisting of hydrogen, methyl, ethyl, and propyl;

supplying a second monomer having the structure



wherein POLYMER2 is a non-water soluble polymeric material having a number average molecular weight of 5,000 or greater;

mixing said second monomer with said first monomer;

adding a cationic polymerization catalyst R'X to said monomer mixture to form a reaction mixture, wherein X is selected from the group consisting of acetate, p-tosylate, halide, sulfate, triflate, and mixtures thereof, and wherein R' is selected from the group consisting of hydrogen, alkyl, or aralkyl;

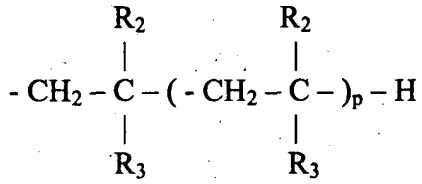
stirring said reaction mixture; and

heating said reaction mixture at a temperature of between about 7 °C to about 180 °C to form said polymeric composition.

9. The method of claim 8, wherein said heating step is performed in a solvent.

10. The method of claim 9, wherein said solvent is selected from the group consisting of orthodichlorobenzene, ethyl benzene, cumene, xylene, decane, 2-ethyl hexyl acetate, naphthalene, octane, and mixtures thereof.

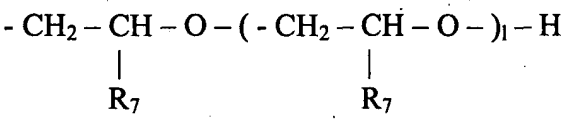
11. The method of claim 8, wherein POLYMER2 has the structure



wherein R_2 is selected from the group consisting of hydrogen, methyl, and mixtures thereof, and R_3 is selected from the group consisting of hydrogen, methyl, carbomethoxy, ethenyl, isopropenyl, phenyl, and mixtures thereof.

12. The method of claim 11, wherein n is between about 50 to about 10,000, m is adjusted such that m/(n + m) is between about 0.0001 to about 0.20, and p is between about 60 to about 1250.

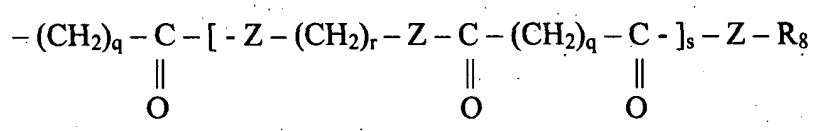
13. The method of claim 8, wherein POLYMER2 has the structure



wherein R_7 is selected from the group consisting of hydrogen, methyl, and mixtures thereof

14. The method of claim 13, wherein n is between about 50 to about 10,000, m is adjusted such that m/(n + m) is between about 0.0001 to about 0.20, l is between about 60 to about 1250.

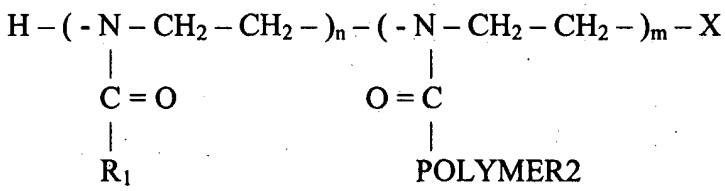
15. The method of claim 8, wherein POLYMER2 has the structure



wherein Z is selected from the group consisting of O, NH, and mixtures thereof, and R_8 is selected from the group consisting of methyl, ethyl, propyl, and butyl.

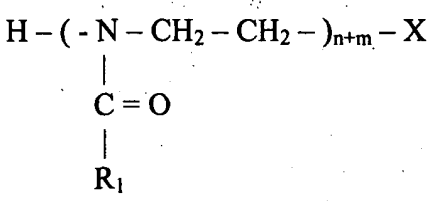
16. The method of claim 15, wherein n is between about 50 to about 10,000, m is adjusted such that m/(n + m) is between about 0.0001 to about 0.20, q is between 4 to about 12, r is between 4 to about 12, s is between about 25 to about 450.

17. A method to form a polymeric composition having the structure



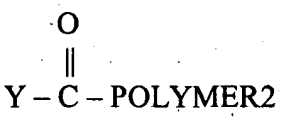
wherein R_1 is selected from the group consisting of hydrogen, methyl, ethyl, and propyl, X is selected from the group consisting of acetate, p-tosylate, halide, sulfate, triflate, and mixtures thereof, and POLYMER2 is a water-insoluble polymeric material having a number average molecular weight of 5,000 or greater; comprising the steps of:

supplying a first polymer having the structure



wherein R_1 is selected from the group consisting of hydrogen, methyl, ethyl, and propyl, and X is selected from the group consisting of acetate, p-tosylate, halide, sulfate, triflate, and mixtures thereof;

supplying a second polymer having the structure



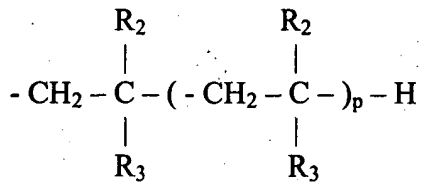
wherein POLYMER2 is a non water soluble polymeric material having a number average molecular weight of 5,000 or greater, and Y is selected from the group consisting of OH, Cl, O^-Na^+, O^-K^+, and O^-Li^+;

mixing said second polymer with said first polymer to form a reaction mixture;

stirring said reaction mixture; and

heating said reaction mixture while removing R_1-COOH as it forms, to form said polymeric composition.

18. The method of claim 17, wherein POLYMER2 has the structure



wherein R_2 is selected from the group consisting of hydrogen, methyl, and mixtures thereof, and R_3 is selected from the group consisting of hydrogen, methyl, ethenyl, isopropenyl, carbomethoxy, phenyl, and mixtures thereof.

19. The method of claim 18, wherein n is between about 50 to about 10,000, m is adjusted such that m/(n + m) is between about 0.0001 to about 0.20, and p is between about 60 to about 1250.

20. The method of claim 17, wherein POLYMER2 has the structure

$$-CH_2-\underset{\displaystyle R_4}{\underset{|}{CH}}-O-(-CH_2-\underset{\displaystyle R_4}{\underset{|}{CH}}-O-)_l-H$$

wherein R_4 is selected from the group consisting of hydrogen, methyl, and mixtures thereof.

21. The method of claim 20, wherein n is between about 50 to about 10,000, m is adjusted such that m/(n + m) is between about 0.0001 to about 0.20, l is between about 60 to about 1250.

22. The method of claim 17, wherein POLYMER2 has the structure

$$-(CH_2)_q-\underset{\displaystyle O}{\underset{\|}{C}}-[-Z-(CH_2)_r-Z-\underset{\displaystyle O}{\underset{\|}{C}}-(CH_2)_q-\underset{\displaystyle O}{\underset{\|}{C}}-]_s-Z-R_5$$

wherein Z is selected from the group consisting of O, NH, and mixtures thereof, and R_5 is selected from the group consisting of methyl, ethyl, propyl, and butyl.

23. The method of claim 22, wherein n is between about 50 to about 10,000, m is adjusted such that m/(n + m) is between about 0.0001 to about 0.20, q is between 4 to about 12, r is between 4 to about 12, s is between about 25 to about 450.